

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental 2425 New Holland Pike Lancaster, PA 17601 Stantec 1060 Andrew Drive Suite 140 West Chester PA 19380

Prepared for:

Report Date: November 03, 2016

Project: Marcus Hook Annual Perimeter Sampling

Submittal Date: 10/18/2016 Group Number: 1724043 PO Number: MARCUS HOOK State of Sample Origin: PA

	Lancaster Labs
Client Sample Description	<u>(LL) #</u>
TRIP BLANK Water	8657463
EB-20161017 Grab Groundwater	8657464
MW-295-20161017 Grab Groundwater	8657465
MW-28-20161017 Grab Groundwater	8657466
MW-29-20161017 Grab Groundwater	8657467
MW-30-20161017 Grab Groundwater	8657468
MW-24-20161017 Grab Groundwater	8657469
MW-8-20161018 Grab Groundwater	8657470
MW-6-20161018 Grab Groundwater	8657471
MW-129-20161018 Grab Groundwater	8657472
MW-581-20161018 Grab Groundwater	8657473

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To Stantec Attn: Andrew Bradley Electronic Copy To Sunoco c/o Stantec Attn: Jennifer Menges

Analysis Report

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Respectfully Submitted,

Amek Carter Specialist

(717) 556-7252



Analysis Report

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Sample Description: TRIP BLANK Water

Marcus Hook

LL Sample # WW 8657463 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/06/2016 Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

Submitted: 10/18/2016 17:55 Reported: 11/03/2016 13:39

MHK17

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS	Volatiles SW-846	8260B	ug/l	ug/l	
10945	Benzene	71-43-2	N.D.	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.	0.5	1
10945	Ethylbenzene	100-41-4	N.D.	0.5	1
10945	Isopropylbenzene	98-82-8	N.D.	0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	1
10945	Toluene	108-88-3	N.D.	0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.	0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.	0.5	1
10945	Xylene (Total)	1330-20-7	N.D.	0.5	1
Volati Extra	iles by SW-846	8011	ug/l	ug/l	
10398	Ethylene dibromide	106-93-4	N.D.	0.0095	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17. This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 11:29	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016 11:29	Anita M Dale	1
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016 16:12	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016 15:00	Edwin Ortiz	1



Reported: 11/03/2016 13:39

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Analysis Report

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Sample Description: EB-20161017 Grab Groundwater

Marcus Hook

LL Sample # WW 8657464 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 07:50 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

EB-17

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846 8	3260B	ug/l	ug/l	
10945	Benzene		71-43-2	N.D.	0.5	1
10945	1,2-Dichloroethane		107-06-2	N.D.	0.5	1
10945	Ethylbenzene		100-41-4	N.D.	0.5	1
10945	Isopropylbenzene		98-82-8	N.D.	0.5	1
10945	Methyl Tertiary But	yl Ether	1634-04-4	N.D.	0.5	1
10945	Toluene		108-88-3	N.D.	0.5	1
10945	1,2,4-Trimethylbenz	ene	95-63-6	N.D.	0.5	1
10945	1,3,5-Trimethylbenz	ene	108-67-8	N.D.	0.5	1
10945	Xylene (Total)		1330-20-7	N.D.	0.5	1
GC/MS	Semivolatiles	SW-846 8	3270C	ug/l	ug/l	
14249	Anthracene		120-12-7	N.D.	0.1	1
14249	Benzo(a)anthracene		56-55-3	N.D.	0.1	1
14249	Benzo(a)pyrene		50-32-8	N.D.	0.1	1
14249	Benzo(b) fluoranthen	е	205-99-2	N.D.	0.1	1
14249	Benzo(g,h,i)perylen	Э	191-24-2	N.D.	0.1	1
14249	Chrysene		218-01-9	N.D.	0.1	1
14249	Fluorene		86-73-7	N.D.	0.1	1
14249	Naphthalene		91-20-3	N.D.	0.1	1
14249	Phenanthrene		85-01-8	N.D.	0.1	1
14249			129-00-0	N.D.	0.1	1
	surrogate QC limits a cs can be obtained to					
Volati	les by	SW-846 8	3011	ug/l	ug/l	
Extrac	tion					
10398	Ethylene dibromide		106-93-4	N.D.	0.0095	1
Metals	Dissolved	SW-846 6	5020	ug/l	ug/l	
06035	Lead		7439-92-1	N.D.	0.090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17. This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Gample	Analweie	Pecord
Laboratory	Sampre	AHALYSIS	Kecora

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 11:51	Anita M Dale	1
01163	GC/MS VOA Water Pren	SW-846 5030B	1	F163012AA	10/27/2016 11.51	Anita M Dale	1



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Sample Description: EB-20161017 Grab Groundwater

Marcus Hook

LL Sample # WW 8657464 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 07:50 by DH Stantec

modified

1060 Andrew Drive

Suite 140

West Chester PA 19380

EB-17

Laboratory Sample Analysis Record Method Trial# Batch# CAT Analysis Name Analysis Analyst Dilution No. Date and Time 14249 PAHs 8270C MINI SW-846 8270C 16298WAD026 10/26/2016 11:03 Catherine E Bachman 07807 BNA Water Extraction SW-846 3510C 16298WAD026 10/24/2016 17:00 Kate E Lutte 162980034A 10398 EDB in Wastewater SW-846 8011 10/27/2016 16:28 Heather M Miller 10/25/2016 15:00 10/31/2016 18:54 07786 EDB Extraction (8011) SW-846 8011 162980034A Edwin Ortiz 163026050002A SW-846 6020 Patrick J Engle 06035 Lead 1 10/29/2016 06:10 Lisa J Cooke 06050 ICPMS-Water, 3020A - U3 SW-846 3010A 1 163026050002 1



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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-295-20161017 Grab Groundwater

Marcus Hook

LL Sample # WW 8657465 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 09:20 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

295--

CAT No.	Analysis Name		CAS Number	Resul	t	Method Detection Limit	Dilution Factor	
GC/MS	Volatiles	SW-846	8260B	ug/l		ug/l		
10945	Benzene		71-43-2	N.D.		0.5	1	
10945	1,2-Dichloroethane		107-06-2	N.D.		0.5	1	
10945			100-41-4	N.D.		0.5	1	
10945	Isopropylbenzene		98-82-8	N.D.		0.5	1	
10945	Methyl Tertiary But	yl Ether	1634-04-4	N.D.		0.5	1	
10945	Toluene		108-88-3	N.D.		0.5	1	
10945	1,2,4-Trimethylbenz		95-63-6	N.D.		0.5	1	
	1,3,5-Trimethylbenz	ene	108-67-8	N.D.		0.5	1	
10945	Xylene (Total)		1330-20-7	N.D.		0.5	1	
GC/MS	Semivolatiles	SW-846	8270C	ug/l		ug/l		
14249	Anthracene		120-12-7	N.D.		0.5	1	
14249	Benzo(a)anthracene		56-55-3	0.7	J	0.5	1	
14249	Benzo(a)pyrene		50-32-8	0.9	J	0.5	1	
14249	Benzo(b) fluoranthen	е	205-99-2	1	J	0.5	1	
14249	Benzo(g,h,i)perylen	е	191-24-2	1	J	0.5	1	
14249	Chrysene		218-01-9	1	J	0.5	1	
14249	Fluorene		86-73-7	N.D.		0.5	1	
14249			91-20-3	2	J	0.5	1	
14249	Phenanthrene		85-01-8	2	J	0.5	1	
14249	Pyrene		129-00-0	2	J	0.5	1	
Repo	rting limits were rai	ised due t	o interference fi	rom the s	sample matrix.			
	surrogate QC limits ats can be obtained to				data			
	iles by	SW-846	8011	ug/l		ug/l		
Extrac	ction							
10398	Ethylene dibromide		106-93-4	N.D.		0.0092	1	
Metals	Dissolved	SW-846	6020	ug/l		ug/l		
06035	Lead		7439-92-1	N.D.		0.090	1	

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17. This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT	Analysis Name	Method	Trial#	Batch#	Analysis	Analyst	Dilution
No.					Date and Time		Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 12:13	Anita M Dale	1



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06050 ICPMS-Water, 3020A - U3

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Sample Description: MW-295-20161017 Grab Groundwater

Marcus Hook

LL Sample # WW 8657465 LL Group # 1724043

Account # 16657

Lisa J Cooke

1

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 09:20 by DH Stantec

SW-846 3010A

modified

1060 Andrew Drive

Suite 140

West Chester PA 19380

10/29/2016 06:10

295--

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time 01163 GC/MS VOA Water Prep SW-846 5030B F163012AA 10/27/2016 12:13 Anita M Dale 14249 PAHs 8270C MINI SW-846 8270C 16298WAD026 10/26/2016 11:31 Catherine E 1 Bachman 07807 BNA Water Extraction SW-846 3510C 16298WAD026 10/24/2016 17:00 Kate E Lutte 10/27/2016 16:59 10/25/2016 15:00 10398 EDB in Wastewater SW-846 8011 162980034A Heather M Miller 1 162980034A 07786 EDB Extraction (8011) SW-846 8011 Edwin Ortiz 1 163026050002A 06035 Lead SW-846 6020 1 10/31/2016 18:56 Patrick J Engle 1

163026050002

1



Reported: 11/03/2016 13:39

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Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-28-20161017 Grab Groundwater

Marcus Hook

LL Sample # WW 8657466 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 10:25 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

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CAT No.	Analysis Name		CAS Number	Resul	t		thod tection Limit	Dilution Factor	
GC/MS	Volatiles	SW-846	8260B	ug/l		ug/	' 1		
10945	Benzene		71-43-2	N.D.		0.5	5	1	
10945	1,2-Dichloroethane		107-06-2	N.D.		0.5	5	1	
10945	Ethylbenzene		100-41-4	N.D.		0.5	5	1	
10945	Isopropylbenzene		98-82-8	N.D.		0.5	5	1	
10945	Methyl Tertiary Buty	yl Ether	1634-04-4	N.D.		0.5	5	1	
10945	Toluene		108-88-3	N.D.		0.5	5	1	
10945	1,2,4-Trimethylbenze	ene	95-63-6	N.D.		0.5	5	1	
10945	1,3,5-Trimethylbenze	ene	108-67-8	N.D.		0.5	5	1	
10945	Xylene (Total)		1330-20-7	N.D.		0.5	5	1	
GC/MS	Semivolatiles	SW-846	8270C	ug/l		ug/	/1		
14249	Anthracene		120-12-7	N.D.		0.1	L	1	
14249	Benzo(a)anthracene		56-55-3	N.D.		0.1	L	1	
14249	Benzo(a)pyrene		50-32-8	N.D.		0.1	L	1	
14249	Benzo(b) fluoranthene	9	205-99-2	N.D.		0.1	L	1	
14249	Benzo(g,h,i)perylene	9	191-24-2	N.D.		0.1	L	1	
14249	Chrysene		218-01-9	N.D.		0.1	L	1	
14249	Fluorene		86-73-7	N.D.		0.1	L	1	
	Naphthalene		91-20-3	0.1	J	0.1	L	1	
14249	Phenanthrene		85-01-8	N.D.		0.1		1	
14249	2		129-00-0	0.1	J	0.1	L	1	
	surrogate QC limits a ts can be obtained to				data				
Volati	iles by	SW-846	8011	ug/l		ug/	' 1		
Extrac	ction								
10398	Ethylene dibromide		106-93-4	N.D.		0.0	0095	1	
Metals	s Dissolved	SW-846	6020	ug/l		ug/	/1		
06035	Lead		7439-92-1	0.11	J	0.0)90	1	

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17. This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 12:35	Anita M Dale	1
01163	GC/MS VOA Water Pren	SW-846 5030B	1	F163012AA	10/27/2016 12:35	Anita M Dale	1



Reported: 11/03/2016 13:39

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Analysis Report

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Sample Description: MW-28-20161017 Grab Groundwater

Marcus Hook

LL Sample # WW 8657466 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 10:25 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

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	Laboratory Sample Analysis Record									
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor		
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016	11:59	Catherine E Bachman	1		
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016	17:00	Kate E Lutte	1		
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016	17:14	Heather M Miller	1		
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016	15:00	Edwin Ortiz	1		
06035	Lead	SW-846 6020	1	163026050002A	10/31/2016	18:58	Patrick J Engle	1		
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050002	10/29/2016	06:10	Lisa J Cooke	1		



Reported: 11/03/2016 13:39

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Analysis Report

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Sample Description: MW-29-20161017 Grab Groundwater

Marcus Hook

LL Sample # WW 8657467 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 11:00 by DH

1060 Andrew Drive

Suite 140

Stantec

West Chester PA 19380

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CAT No.	Analysis Name		CAS Number	Resul	t	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l		ug/l	
10945	Benzene		71-43-2	N.D.		0.5	1
10945	1,2-Dichloroethane		107-06-2	N.D.		0.5	1
10945	Ethylbenzene		100-41-4	N.D.		0.5	1
10945	Isopropylbenzene		98-82-8	1	J	0.5	1
10945	Methyl Tertiary But	yl Ether	1634-04-4	N.D.		0.5	1
10945	Toluene		108-88-3	N.D.		0.5	1
10945	1,2,4-Trimethylbenze	ene	95-63-6	N.D.		0.5	1
10945	1,3,5-Trimethylbenze	ene	108-67-8	N.D.		0.5	1
10945	Xylene (Total)		1330-20-7	N.D.		0.5	1
GC/MS	Semivolatiles	SW-846	8270C	ug/l		ug/l	
14249	Anthracene		120-12-7	0.1	J	0.1	1
14249	Benzo(a)anthracene		56-55-3	N.D.		0.1	1
14249	Benzo(a)pyrene		50-32-8	0.1	J	0.1	1
14249	Benzo(b) fluoranthen	е	205-99-2	0.2	J	0.1	1
14249	Benzo(g,h,i)perylen	е	191-24-2	0.1	J	0.1	1
14249	Chrysene		218-01-9	0.2	J	0.1	1
14249			86-73-7	0.2	J	0.1	1
14249	- E		91-20-3	N.D.		0.1	1
14249	Phenanthrene		85-01-8	0.2	J	0.1	1
14249	Pyrene		129-00-0	0.4	J	0.1	1
	surrogate QC limits a cs can be obtained to				data		
Volati	les by	SW-846	8011	ug/l		ug/l	
Extrac	tion						
10398	Ethylene dibromide		106-93-4	N.D.		0.0096	1
Metals	Dissolved	SW-846	6020	ug/l		ug/l	
06035	Lead		7439-92-1	N.D.		0.090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17. This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 12:56	Anita M Dale	1
01163	GC/MS VOA Water Pren	SW-846 5030B	1	F163012AA	10/27/2016 12:56	Anita M Dale	1



Analysis Report

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Sample Description: MW-29-20161017 Grab Groundwater

Marcus Hook

LL Sample # WW 8657467 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 11:00 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

Reported: 11/03/2016 13:39

Submitted: 10/18/2016 17:55

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Laboratory Sample Analysis Record Method Trial# Batch# CAT Analysis Name Analysis Analyst Dilution No. Date and Time 14249 PAHs 8270C MINI SW-846 8270C 16298WAD026 10/26/2016 12:27 Catherine E Bachman 07807 BNA Water Extraction SW-846 3510C 16298WAD026 10/24/2016 17:00 Kate E Lutte 10398 EDB in Wastewater SW-846 8011 162980034A 10/27/2016 17:30 Heather M Miller 10/25/2016 15:00 10/31/2016 18:59 07786 EDB Extraction (8011) SW-846 8011 162980034A Edwin Ortiz 163026050002A SW-846 6020 Patrick J Engle 06035 Lead 1 06050 ICPMS-Water, 3020A - U3 SW-846 3010A 1 163026050002 10/29/2016 06:10 Lisa J Cooke 1 modified



Reported: 11/03/2016 13:39

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Sample Description: MW-30-20161017 Grab Groundwater

Marcus Hook

LL Sample # WW 8657468 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 11:45 by DH

1060 Andrew Drive

Suite 140

Stantec

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West Chester PA 19380

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CAT No.	Analysis Name		CAS Number	Resul	t	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l		ug/l	
10945	Benzene		71-43-2	6		0.5	1
10945	1,2-Dichloroethane		107-06-2	N.D.		0.5	1
10945	Ethylbenzene		100-41-4	0.7	J	0.5	1
10945	Isopropylbenzene		98-82-8	0.5	J	0.5	1
10945	Methyl Tertiary But	yl Ether	1634-04-4	N.D.		0.5	1
10945	Toluene		108-88-3	N.D.		0.5	1
10945	1,2,4-Trimethylbenz	ene	95-63-6	1	J	0.5	1
10945	1,3,5-Trimethylbenz	ene	108-67-8	N.D.		0.5	1
10945	Xylene (Total)		1330-20-7	1		0.5	1
GC/MS	Semivolatiles	SW-846	8270C	ug/l		ug/l	
14249	Anthracene		120-12-7	N.D.		0.1	1
14249	Benzo(a)anthracene		56-55-3	N.D.		0.1	1
14249	Benzo(a)pyrene		50-32-8	N.D.		0.1	1
14249	Benzo(b)fluoranthen	е	205-99-2	N.D.		0.1	1
14249	Benzo(g,h,i)perylen	е	191-24-2	N.D.		0.1	1
14249	Chrysene		218-01-9	N.D.		0.1	1
14249	Fluorene		86-73-7	0.2	J	0.1	1
14249	Naphthalene		91-20-3	2		0.1	1
14249	Phenanthrene		85-01-8	0.2	J	0.1	1
	Pyrene		129-00-0	N.D.		0.1	1
	surrogate QC limits ats can be obtained to				data		
Volati	iles by	SW-846	8011	ug/l		ug/l	
Extra 0	etion Ethylene dibromide		106-93-4	N.D.		0.0095	1
Metals	B Dissolved	SW-846	6020	ug/l		ug/l	
06035		5H-040	7439-92-1	0.22	J	0.090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17. This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Campla	Analardid	Pogord
Laboratory	Samble	Anaivsis	Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 13:18	Anita M Dale	1
01163	GC/MS VOA Water Pren	SW-846 5030B	1	F163012AA	10/27/2016 13.18	Anita M Dale	1



Reported: 11/03/2016 13:39

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-30-20161017 Grab Groundwater

Marcus Hook

LL Sample # WW 8657468 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 11:45 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

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	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	.me	Analyst	Dilution Factor			
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016	12:55	Catherine E Bachman	1			
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016	17:00	Kate E Lutte	1			
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016	18:01	Heather M Miller	1			
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016	15:00	Edwin Ortiz	1			
06035	Lead	SW-846 6020	1	163026050002A	10/31/2016	19:01	Patrick J Engle	1			
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050002	10/29/2016	06:10	Lisa J Cooke	1			



Reported: 11/03/2016 13:39

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-24-20161017 Grab Groundwater

Marcus Hook

LL Sample # WW 8657469 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 13:40 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

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CAT No.	Analysis Name	CAS Number	Resul	t	Method Detection Limit	Dilution Factor
GC/MS	Volatiles SW-846	8260B	ug/l		ug/l	
10945	Benzene	71-43-2	0.8	J	0.5	1
10945	1,2-Dichloroethane	107-06-2	N.D.		0.5	1
10945	Ethylbenzene	100-41-4	N.D.		0.5	1
10945	Isopropylbenzene	98-82-8	N.D.		0.5	1
10945	Methyl Tertiary Butyl Ether	1634-04-4	0.8	J	0.5	1
10945	Toluene	108-88-3	N.D.		0.5	1
10945	1,2,4-Trimethylbenzene	95-63-6	N.D.		0.5	1
10945	1,3,5-Trimethylbenzene	108-67-8	N.D.		0.5	1
10945	Xylene (Total)	1330-20-7	N.D.		0.5	1
GC/MS	Semivolatiles SW-846	8270C	ug/l		ug/l	
14249	Anthracene	120-12-7	N.D.		0.1	1
14249	Benzo(a)anthracene	56-55-3	N.D.		0.1	1
14249	Benzo(a)pyrene	50-32-8	N.D.		0.1	1
14249	Benzo(b)fluoranthene	205-99-2	0.1	J	0.1	1
14249	Benzo(g,h,i)perylene	191-24-2	N.D.		0.1	1
14249	Chrysene	218-01-9	N.D.		0.1	1
14249	Fluorene	86-73-7	N.D.		0.1	1
14249	Naphthalene	91-20-3	N.D.		0.1	1
14249	Phenanthrene	85-01-8	N.D.		0.1	1
14249	Pyrene	129-00-0	0.2	J	0.1	1
The	surrogate QC limits are advis	ory only until suf	ficient	data		

The surrogate QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The stated QC limits are advisory only until sufficient data points can be obtained to calculate statistical limits.

The recovery for the sample surrogate(s) is <10% as noted on the QC Summary. The following corrective action was taken: The sample was re-extracted outside the method required holding time and the QC was acceptable. All results are reported from the first trial. Similar results were obtained in both trials with the exception of:

several target compounds were detected in the re-extraction.

Volatiles by Extraction	SW-846 8011	ug/l	ug/1	
10398 Ethylene dibromide	106-93-4	N.D.	0.0094 1	
Metals Dissolved	SW-846 6020 7439-92-1	ug/1 0.24 J	ug/1 0.090 1	
00033 Leau	7439-92-1	0.24 0	0.090	



Reported: 11/03/2016 13:39

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-24-20161017 Grab Groundwater

Marcus Hook

LL Sample # WW 8657469 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/17/2016 13:40 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

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Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17. This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

			-					
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016	13:39	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016	13:39	Anita M Dale	1
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016	13:23	Catherine E Bachman	1
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016	17:00	Kate E Lutte	1
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016	18:48	Heather M Miller	1
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016	15:00	Edwin Ortiz	1
06035	Lead	SW-846 6020	1	163026050002A	10/31/2016	18:14	Patrick J Engle	1
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050002	10/29/2016	06:10	Lisa J Cooke	1



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-8-20161018 Grab Groundwater

Marcus Hook

LL Sample # WW 8657470 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 08:30 by DH

Submitted: 10/18/2016 17:55

Reported: 11/03/2016 13:39

Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

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CAT No.	Analysis Name		CAS Number	Resul	t	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l		ug/l	
10945	Benzene		71-43-2	N.D.		0.5	1
10945	1,2-Dichloroethane		107-06-2	N.D.		0.5	1
10945	Ethylbenzene		100-41-4	N.D.		0.5	1
10945	Isopropylbenzene		98-82-8	3		0.5	1
10945	Methyl Tertiary But	yl Ether	1634-04-4	7		0.5	1
10945	Toluene		108-88-3	N.D.		0.5	1
10945	1,2,4-Trimethylbenze	ene	95-63-6	N.D.		0.5	1
10945	1,3,5-Trimethylbenze	ene	108-67-8	N.D.		0.5	1
10945	Xylene (Total)		1330-20-7	N.D.		0.5	1
GC/MS	Semivolatiles	SW-846	8270C	ug/l		ug/l	
14249	Anthracene		120-12-7	0.1	J	0.1	1
14249	Benzo(a)anthracene		56-55-3	N.D.		0.1	1
14249	Benzo(a)pyrene		50-32-8	N.D.		0.1	1
14249	Benzo(b) fluoranthen	е	205-99-2	N.D.		0.1	1
14249	Benzo(g,h,i)perylen	е	191-24-2	N.D.		0.1	1
14249	Chrysene		218-01-9	N.D.		0.1	1
	Fluorene		86-73-7	0.9		0.1	1
	Naphthalene		91-20-3	0.1	J	0.1	1
	Phenanthrene		85-01-8	1		0.1	1
	Pyrene		129-00-0	0.1	J	0.1	1
	surrogate QC limits a cs can be obtained to				data		
Volati	les by	SW-846	8011	ug/l		ug/l	
Extrac	tion						
10398	Ethylene dibromide		106-93-4	N.D.		0.0095	1
Metals	s Dissolved	SW-846	6020	ug/l		ug/l	
06035	Lead		7439-92-1	0.61	J	0.090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17. This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 14:01	Anita M Dale	1
01163	GC/MS VOA Water Pren	SW-846 5030B	1	F163012AA	10/27/2016 14:01	Anita M Dale	1



Reported: 11/03/2016 13:39

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-8-20161018 Grab Groundwater

Marcus Hook

LL Sample # WW 8657470 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 08:30 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

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	Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Ti	me	Analyst	Dilution Factor			
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016	13:51	Catherine E Bachman	1			
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016	17:00	Kate E Lutte	1			
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016	19:04	Heather M Miller	1			
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016	15:00	Edwin Ortiz	1			
06035	Lead	SW-846 6020	1	163026050002A	10/31/2016	19:03	Patrick J Engle	1			
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050002	10/29/2016	06:10	Lisa J Cooke	1			



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-6-20161018 Grab Groundwater

Marcus Hook

LL Sample # WW 8657471 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 09:25 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

Submitted: 10/18/2016 17:55 Reported: 11/03/2016 13:39

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CAT No.	Analysis Name		CAS Number	Resul	Ē	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l		ug/l	
10945	Benzene		71-43-2	N.D.		0.5	1
10945	1,2-Dichloroethane		107-06-2	N.D.		0.5	1
10945	Ethylbenzene		100-41-4	2		0.5	1
10945	Isopropylbenzene		98-82-8	1	J	0.5	1
10945	Methyl Tertiary Buty	yl Ether	1634-04-4	0.7	J	0.5	1
10945	Toluene		108-88-3	N.D.		0.5	1
10945	1,2,4-Trimethylbenze	ene	95-63-6	9		0.5	1
10945	1,3,5-Trimethylbenze	ene	108-67-8	N.D.		0.5	1
10945	Xylene (Total)		1330-20-7	N.D.		0.5	1
GC/MS	Semivolatiles	SW-846	8270C	ug/l		ug/l	
14249	Anthracene		120-12-7	2		0.1	1
14249	Benzo(a)anthracene		56-55-3	N.D.		0.1	1
14249	Benzo(a)pyrene		50-32-8	N.D.		0.1	1
14249	Benzo(b) fluoranthene	e	205-99-2	N.D.		0.1	1
14249	Benzo(g,h,i)perylene	Э	191-24-2	N.D.		0.1	1
14249	Chrysene		218-01-9	N.D.		0.1	1
14249	Fluorene		86-73-7	7		0.1	1
14249	Naphthalene		91-20-3	2		0.1	1
14249	Phenanthrene		85-01-8	12		0.1	1
14249	Pyrene		129-00-0	2		0.1	1
	surrogate QC limits a cs can be obtained to				data		
Volati	les by	SW-846	8011	ug/l		ug/l	
Extrac	-						
	Ethylene dibromide		106-93-4	N.D.		0.0094	1
Metals	B Dissolved	SW-846	6020	ug/l		ug/l	
06035			7439-92-1	N.D.		0.090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17. This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor	
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 14:23	Anita M Dale	1	
01163	GC/MS VOA Water Pren	SW-846 5030B	1	F163012AA	10/27/2016 14.23	Anita M Dale	1	



Reported: 11/03/2016 13:39

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-6-20161018 Grab Groundwater

Marcus Hook

LL Sample # WW 8657471 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 09:25 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

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Laboratory Sample Analysis Record Method Trial# Batch# CAT Analysis Name Analysis Analyst Dilution No. Date and Time 14249 PAHs 8270C MINI SW-846 8270C 16298WAD026 10/26/2016 14:19 Catherine E Bachman 07807 BNA Water Extraction SW-846 3510C 16298WAD026 10/24/2016 17:00 Kate E Lutte SW-846 8011 10398 EDB in Wastewater 162980034A 10/27/2016 19:19 Heather M Miller 10/25/2016 15:00 11/03/2016 05:00 07786 EDB Extraction (8011) SW-846 8011 162980034A Edwin Ortiz 163026050003A SW-846 6020 Choon Y Tian 06035 Lead 06050 ICPMS-Water, 3020A - U3 SW-846 3010A 1 163026050003 10/30/2016 07:22 James L Mertz 1 modified



Reported: 11/03/2016 13:39

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-129-20161018 Grab Groundwater

Marcus Hook

LL Sample # WW 8657472 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 10:45 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

-129-

CAT No.	Analysis Name		CAS Number	Result	Ė	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l		ug/l	
10945	Benzene		71-43-2	N.D.		0.5	1
10945	1,2-Dichloroethane		107-06-2	N.D.		0.5	1
10945	Ethylbenzene		100-41-4	N.D.		0.5	1
10945	Isopropylbenzene		98-82-8	0.9	J	0.5	1
10945	Methyl Tertiary Buty	/l Ether	1634-04-4	7		0.5	1
10945	Toluene		108-88-3	N.D.		0.5	1
10945	1,2,4-Trimethylbenze	ene	95-63-6	N.D.		0.5	1
10945	1,3,5-Trimethylbenze	ene	108-67-8	N.D.		0.5	1
10945	Xylene (Total)		1330-20-7	N.D.		0.5	1
GC/MS	Semivolatiles	SW-846	8270C	ug/l		ug/l	
14249	Anthracene		120-12-7	0.3	J	0.1	1
14249	Benzo(a)anthracene		56-55-3	N.D.		0.1	1
14249	Benzo(a)pyrene		50-32-8	N.D.		0.1	1
14249	Benzo(b) fluoranthene	9	205-99-2	N.D.		0.1	1
14249	Benzo(g,h,i)perylene	9	191-24-2	0.1	J	0.1	1
14249	Chrysene		218-01-9	N.D.		0.1	1
14249	Fluorene		86-73-7	2		0.1	1
	Naphthalene		91-20-3	0.1	J	0.1	1
14249	Phenanthrene		85-01-8	N.D.		0.1	1
14249	Pyrene		129-00-0	0.9		0.1	1
	surrogate QC limits a cs can be obtained to				data		
Volati	les by	SW-846	8011	ug/l		ug/l	
Extrac	tion						
10398	Ethylene dibromide		106-93-4	N.D.		0.0095	1
Metals	Dissolved	SW-846	6020	ug/l		ug/l	
06035	Lead		7439-92-1	N.D.		0.090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17. This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 14:45	Anita M Dale	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	F163012AA	10/27/2016 14:45	Anita M Dale	1



Reported: 11/03/2016 13:39

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-129-20161018 Grab Groundwater

Marcus Hook

LL Sample # WW 8657472 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 10:45 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

-129-

Laboratory Sample Analysis Record										
CAT No.	Analysis Name	Method	Trial# Batch#		Analysis Date and Time		Analyst	Dilution Factor		
14249	PAHs 8270C MINI	SW-846 8270C	1	16298WAD026	10/26/2016	14:47	Catherine E Bachman	1		
07807	BNA Water Extraction	SW-846 3510C	1	16298WAD026	10/24/2016	17:00	Kate E Lutte	1		
10398	EDB in Wastewater	SW-846 8011	1	162980034A	10/27/2016	19:35	Heather M Miller	1		
07786	EDB Extraction (8011)	SW-846 8011	1	162980034A	10/25/2016	15:00	Edwin Ortiz	1		
06035	Lead	SW-846 6020	1	163026050003A	11/03/2016	05:01	Choon Y Tian	1		
06050	ICPMS-Water, 3020A - U3	SW-846 3010A modified	1	163026050003	10/30/2016	07:22	James L Mertz	1		



Reported: 11/03/2016 13:39

Lancaster Laboratories Environmental

Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-581-20161018 Grab Groundwater

Marcus Hook

LL Sample # WW 8657473 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 11:30 by DH Stantec

1060 Andrew Drive

Suite 140

West Chester PA 19380

-581-

CAT No.	Analysis Name		CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS	Volatiles	SW-846	8260B	ug/l	ug/l	
10945	Benzene		71-43-2	520	5	10
10945	1,2-Dichloroethane		107-06-2	N.D.	0.5	1
10945	Ethylbenzene		100-41-4	400	5	10
10945	Isopropylbenzene		98-82-8	53	0.5	1
10945	Methyl Tertiary Buty	yl Ether	1634-04-4	2	0.5	1
10945	Toluene		108-88-3	37	0.5	1
10945	1,2,4-Trimethylbenze	ene	95-63-6	200	5	10
10945	1,3,5-Trimethylbenze	ene	108-67-8	75	0.5	1
10945	Xylene (Total)		1330-20-7	1,800	5	10
GC/MS	Semivolatiles	SW-846	8270C	ug/l	ug/l	
14249	Anthracene		120-12-7	0.2 J	0.1	1
14249	Benzo(a)anthracene		56-55-3	N.D.	0.1	1
14249	Benzo(a)pyrene		50-32-8	N.D.	0.1	1
14249	Benzo(b) fluoranthene	9	205-99-2	N.D.	0.1	1
14249	Benzo(g,h,i)perylene	9	191-24-2	N.D.	0.1	1
14249	Chrysene		218-01-9	N.D.	0.1	1
14249	Fluorene		86-73-7	0.9	0.1	1
	Naphthalene		91-20-3	52	0.1	1
14249	Phenanthrene		85-01-8	1	0.1	1
14249			129-00-0	0.6	0.1	1
	surrogate QC limits a cs can be obtained to					
Volati	les by	SW-846	8011	ug/l	ug/l	
Extrac	tion					
10398	Ethylene dibromide		106-93-4	N.D.	0.0095	1
Metals	Dissolved	SW-846	6020	ug/l	ug/l	
06035	Lead		7439-92-1	82.5 B	0.090	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17. This sample was filtered in the lab for dissolved metals..

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory	Gample	Analweie	Pecord
паротасоту	Sampre	AHALYSIS	Kecora

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10945	BTEX/MTBE/Cumene/EDC/TMBs	SW-846 8260B	1	F163012AA	10/27/2016 15:07	Anita M Dale	1
10945	RTEX/MTRE/Cumene/EDC/TMRs	SW-846 8260B	1	F163012AA	10/27/2016 16:58	Anita M Dale	1.0



Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-2681 • www.LancasterLabs.com

Sample Description: MW-581-20161018 Grab Groundwater

Marcus Hook

LL Sample # WW 8657473 LL Group # 1724043 Account # 16657

Project Name: Marcus Hook Annual Perimeter Sampling

Collected: 10/18/2016 11:30 by DH Stanted

1060 Andrew Drive

Suite 140

West Chester PA 19380

Submitted: 10/18/2016 17:55 Reported: 11/03/2016 13:39

-581-

Laboratory Sample Analysis Record Method CAT Analysis Name Trial# Batch# Analysis Analyst Dilution Date and Time Factor 01163 GC/MS VOA Water Prep SW-846 5030B F163012AA 10/27/2016 15:07 Anita M Dale 1 01163 GC/MS VOA Water Prep 10/27/2016 16:58 10/26/2016 15:15 SW-846 5030B 2 F163012AA Anita M Dale 1.0 14249 PAHs 8270C MINI SW-846 8270C 1 16298WAD026 Catherine E 1 Bachman 10/24/2016 17:00 10/27/2016 19:50 07807 BNA Water Extraction SW-846 3510C 16298WAD026 Kate E Lutte 162980034A 10398 EDB in Wastewater SW-846 8011 Heather M Miller 1 162980034A 07786 EDB Extraction (8011) Edwin Ortiz SW-846 8011 1 10/25/2016 15:00 1 06035 Lead SW-846 6020 163026050003A 11/03/2016 05:03 Choon Y Tian 1 06050 ICPMS-Water, 3020A - U3 SW-846 3010A 163026050003 10/30/2016 07:22 James L Mertz modified

Analysis Report

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Quality Control Summary

Client Name: Stantec Group Number: 1724043

Reported: 11/03/2016 13:39

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL				
	ug/l	ug/l				
Batch number: F163012AA Benzene 1,2-Dichloroethane Ethylbenzene Isopropylbenzene Methyl Tertiary Butyl Ether Toluene 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene Xylene (Total)	Sample number N.D. N.D. N.D. N.D. N.D. N.D. N.D. N.D	(s): 8657463-8657473 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5				
Batch number: 16298WAD026 Anthracene Benzo(a) anthracene Benzo(a) pyrene Benzo(b) fluoranthene Benzo(g,h,i) perylene Chrysene Fluorene Naphthalene Phenanthrene Pyrene	N.D. N.D. N.D. N.D. N.D. N.D.	(s): 8657464-8657473 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1				
Batch number: 162980034A Ethylene dibromide	Sample number N.D.	(s): 8657463-8657473 0.010				
Batch number: 163026050002A Lead	Sample number N.D.	(s): 8657464-8657470 0.090				
Batch number: 163026050003A Lead	Sample number 0.12 J	(s): 8657471-8657473 0.090				

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: F163012AA	Sample number	(s): 8657	463-8657473						
Benzene	20	19.33			97		78-120		

^{*-} Outside of specification

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

Analysis Report

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Quality Control Summary

Client Name: Stantec Group Number: 1724043

Reported: 11/03/2016 13:39

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
1,2-Dichloroethane	20	16.1			80		66-128		
Ethylbenzene	20	17.61			88		78-120		
Isopropylbenzene	20	17.89			89		80-120		
Methyl Tertiary Butyl Ether	20	17.52			88		75-120		
Toluene	20	18.22			91		80-120		
1,2,4-Trimethylbenzene	20	18.34			92		75-120		
1,3,5-Trimethylbenzene	20	17.95			90		75-120		
Xylene (Total)	60	53.37			89		80-120		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 16298WAD026	Sample numbe	r(s): 8657	164-8657473						
Anthracene	50	47.54	50	45.18	95	90	70-130	5	30
Benzo(a)anthracene	50	49.14	50	47.75	98	95	70-130	3	30
Benzo(a)pyrene	50	47.97	50	46.12	96	92	70-130	4	30
Benzo(b)fluoranthene	50	48.81	50	46.42	98	93	70-130	5	30
Benzo(g,h,i)perylene	50	49.88	50	48.33	100	97	70-130	3	30
Chrysene	50	50.86	50	49.43	102	99	70-130	3	30
Fluorene	50	45.77	50	44.36	92	89	70-130	3	30
Naphthalene	50	40.22	50	39.27	80	79	70-130	2	30
Phenanthrene	50	46.96	50	45.32	94	91	70-130	4	30
Pyrene	50	48.05	50	47.01	96	94	70-130	2	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 162980034A	Sample numbe	r(s): 86574	163-8657473						
Ethylene dibromide	0.128	0.134	0.128	0.132	105	103	60-140	1	20
	ug/l	ug/l	ug/l	ug/l					
Batch number: 163026050002A	Sample numbe	r(s): 86574	164-8657470						
Lead	15	16.1			107		80-120		
Batch number: 163026050003A	Sample numbe	r(s): 86574	471-8657473						
Lead	15	15.76			105		80-120		

MS/MSD

 ${\tt Unspiked} \ \ ({\tt UNSPK}) \ = \ {\tt the} \ \ {\tt sample} \ \ {\tt used} \ \ {\tt in} \ \ {\tt conjunction} \ \ {\tt with} \ \ {\tt the} \ \ {\tt matrix} \ \ {\tt spike}$

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: F163012AA	Sample numb	er(s): 8657	463-8657	7473 UNSPK:	P655663					
Benzene	N.D.	20	20.4	20	21.1	102	106	78-120	3	30
1,2-Dichloroethane	N.D.	20	16.3	20	17.27	81	86	66-128	6	30
Ethylbenzene	N.D.	20	18.66	20	19.88	93	99	78-120	6	30

^{*-} Outside of specification

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

Analysis Report

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Quality Control Summary

Client Name: Stantec Group Number: 1724043

Reported: 11/03/2016 13:39

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Isopropylbenzene	N.D.	20	19.14	20	20.43	96	102	80-120	6	30
Methyl Tertiary Butyl Ether	N.D.	20	17.28	20	17.72	86	89	75-120	3	30
Toluene	N.D.	20	18.55	20	20.02	93	100	80-120	8	30
1,2,4-Trimethylbenzene	N.D.	20	18.94	20	17.75	95	89	75-120	6	30
1,3,5-Trimethylbenzene	N.D.	20	19.36	20	19.68	97	98	75-120	2	30
Xylene (Total)	N.D.	60	56.11	60	59.82	94	100	80-120	6	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 162980034A	Sample numb	er(s): 8657	463-8657	473 UNSPK:	8657467					
Ethylene dibromide	N.D.	0.122	0.121			99		60-140		
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 163026050002A	Sample numb	er(s): 8657	464-8657	470 UNSPK:	8657469					
Lead	0.238	15	16.06	15	15.85	105	104	75-125	1	20
Batch number: 163026050003A	Sample numb	er(s): 8657	471-8657	473 UNSPK:	P650454					
Lead	0.119	15	16.05	15	16.09	106	106	75-125	0	20

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc ug/l	DUP Conc ug/l	DUP RPD	DUP RPD Max
Batch number: 162980034A Ethylene dibromide	Sample number(s): N.D.	8657463-8657473 BKG: N.D.	8657464 0 (1)	30
	ug/l	ug/l		
Batch number: 163026050002A Lead	Sample number(s): 0.238	8657464-8657470 BKG: 0.235	8657469 1 (1)	20
Batch number: 163026050003A Lead	Sample number(s): 0.119	8657471-8657473 BKG: 0.110	P650454 7 (1)	20

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: BTEX/MTBE/Cumene/EDC/TMBs

Batch number: F163012AA

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



Analysis Report

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Quality Control Summary

Group Number: 1724043 Client Name: Stantec

Reported: 11/03/2016 13:39

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed $% \left(1\right) =\left(1\right) \left(1\right) +\left(1\right) \left(1\right) \left(1\right) +\left(1\right) \left(1\right) \left($ unless attributed to dilution or otherwise noted on the Analysis Report.

	Dibromofluoromethane	1,2-Dichloroethane-d4	4-Bromofluorobenzene	
8657463	96	102	98	91
8657464	98	102	97	94
8657465	98	102	98	94
8657466	97	100	97	93
8657467	96	100	98	94
8657468	96	99	99	95
8657469	97	103	98	95
8657470	98	101	99	94
8657471	98	103	99	95
8657472	98	102	97	95
8657473	97	98	96	102
Blank	98	100	99	93
LCS	98	103	98	95
MS	98	103	98	96
MSD	98	102	99	96

Limits: 80-116 77-113 80-113 78-113

Analysis Name: PAHs 8270C MINI Batch number: 16298WAD026

	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14	
8657464	45*	55*	51*	
8657465	58*	60*	30*	
8657466	78	81	62*	
8657467	71	74	62*	
8657468	70	72	59*	
8657469	5*	5*	5*	
8657470	61*	67*	59*	
8657471	59*	63*	53*	
8657472	77	81	53*	
8657473	63*	62*	44*	
Blank	70	78	83	
LCS	75	79	82	
LCSD	75	77	73	
	F0 100	TO 120	E0 100	

70-130 70-130 70-130 Limits:

Analysis Name: EDB in Wastewater Batch number: 162980034A

1,1,2,2-Tetrachloroethane

8657463	104	
8657464	112	
8657465	94	
8657466	106	
8657467	102	
8657468	116	
8657469	117	

^{*-} Outside of specification

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.



Analysis Report

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Quality Control Summary

Client Name: Stantec Group Number: 1724043

Reported: 11/03/2016 13:39

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

1,1,2,2-Tetrachloroethane
115
123
109
102
110
100
115
111
110

Limits: 46-136

^{*-} Outside of specification

⁽¹⁾ The result for one or both determinations was less than five times the LOQ.

⁽²⁾ The unspiked result was more than four times the spike added.

Environmental Analysis Request/Chain of Custody

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Environmental Analysis Request/Chain of Custody

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Evergreen Petroleum Short List (June 2016)

VOCs by EPA Method 8260	CAS No.
Benzene	71-43-2
Cumene	98-82-8
Dichloroethane, 1,2-	107-06-2
Ethylbenzene	100-41-4
Ethylene Dibromide*	106-93-4
Methyl tert butyl ether	1634-04-4
Toluene	108-88-3
Trimethylbenzene, 1,2,4-	95-63-6
Trimethylbenzene, 1,3,5-	108-67-8
Xylenes	1330-20-7
SVOCs by EPA Method 8270	CAS No.
Anthracene	120-12-7
Benzo(a)anthracene	56-55-3
Benzo(a)pyrene	50-32-8
Benzo(a)fluoranthene	205-99-2
Benzo(g,h,i)perylene	191-24-2
Chrysene	218-01-9
Fluorene	86-73-7
Naphthalene**	91-20-3
Phenanthrene	85-01-8
Pyrene	129-00-0
Metals by Method 6010/6020	CAS No.
Lead***	7439-92-1

^{*}Ethylene Dibromide (EDB) should be analyzed by Method 8011 instead of 8260 in soil for tank investigations and in **all groundwater samples**. EDB in all trip blank samples should be analyzed by 8260 regardless of method used for primary samples.

This list is comprised of the combined PADEP Short List of Petroleum Products (leaded and unleaded gasoline and No. 1, 2, 4, 5, 6 Fuel Oils).

^{**}Naphthalene should be analyzed by EPA Method 8260 instead of 8270 for tank investigations.

^{***}Metals analysis should be total in soil and dissolved in groundwater.

💸 eurofins

Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID:

165578

Group Number(s): 1724043

Client: Stantec

Delivery and Receipt Information

Delivery Method:

ELLE Courier

Arrival Timestamp:

10/18/2016 17:55

Number of Packages:

Custody Seal Present:

Custody Seal Intact:

<u>2</u>

Number of Projects:

1

State/Province of Origin:

<u>PA</u>

Arrival Condition Summary

Yes Shipping Container Sealed: Yes

Yes

Yes

Yes

No

No

No

Yes

Samples Chilled: Paperwork Enclosed: Samples Intact:

Missing Samples:

Extra Samples:

Discrepancy in Container Qty on COC:

Sample IDs on COC match Containers:

Sample Date/Times match COC:

VOA Vial Headspace ≥ 6mm:

Total Trip Blank Qty: Trip Blank Type:

Air Quality Samples Present:

HCI No

2

Yes

Yes

N/A

Unpacked by Cathy Murphy (10960) at 18:37 on 10/18/2016

Samples Chilled Details

Thermometer Types:

DT = Digital (Temp. Bottle)

IR = Infrared (Surface Temp)

All Temperatures in °C.

Cooler #	<u>Thermometer ID</u>	Corrected Temp	Therm. Type	<u>ice iype</u>	ice Present?	ice Container	Lievated Temps
1	DT146	1.5	DT	Wet	Υ	Bagged	N
2	DT146	1.9	DT	Wet	Υ	Bagged	N



Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL Below Minimum Quantitation Level mq milligram(s) degrees Celsius mĹ milliliter(s) C cfu colony forming units MPN Most Probable Number **CP Units** cobalt-chloroplatinate units N.D. none detected F degrees Fahrenheit ng nanogram(s) nephelometric turbidity units gram(s) NTU g IU International Units pg/L picogram/liter kilogram(s) RLkg Reporting Limit **TNTC** liter(s) Too Numerous To Count pound(s) lb. microgram(s) μg μĹ microliter(s) m3 cubic meter(s) milliequivalents umhos/cm micromhos/cm meg

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight Besults printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an

as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank

C - Result confirmed by reanalysis

E - Concentration exceeds the calibration range

J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)

P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.

U - Analyte was not detected at the value indicated

V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference...

W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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Additional Data Qualifiers

Qualifier	Definition
В	Detection in the Blank
Q0	LCS/LCSD Low
Q1	LCS/LCSD High
Q4	MS/MSD Out of Range
Q7	LCS/LCSD RPD
Q8	DUP RPD
Q9	MS/MSD RPD